Session 3D: Effects and Ecological Interactions of Cultured Bivalves

Questions & Answers

Q: Do you have anything that you use as a reference site, in terms of reestablishing reef? Are there any reefs that exist on the coast?

A: They're just not there. Instead, what we've done, is first just track what's happening, but secondly, and maybe the finfish story is the better answers that. Just because we find finfish showing up around a reef, doesn't mean much. What I did not show was among the thousands upon thousands of samples we've counted, it's how many we have done gut analysis on, we've begun to understand a little about the food web dynamics. We're not all the way to the point yet that I can say that one square meter of oyster reef contributes this many kilograms of new finfish production. But that's the road we are heading down, and if you are talking about finfish, make that comparison to adjacent unmanipulated habitats or you can do the same thing with nitrogen removal. So our role has always been to try to make that comparison to adjacent unmanipulated habitats, not to either historical data which we don't have or a decent sign.

Q: Can one of the speakers talk about the extent of genetic interaction between cultured and native species in this area.

A: I can certainly talk *ad nauseam* about the interaction between the various siblings species of mussels that are used in aquaculture a scenario that I studied extensively, and I guess the point I want to make is that while these species do interact genetically, we find throughout the world that they also make the parent population maintain their genetic integrity in spite of that gene. I first found *Mytilus edulis* in the Mediterranean mussel in 1897 in Dyes Inlet in Washington State, and I have been following that species and its interaction with *Mytilus trossulus*, the Baltic mussel, which is the more common species for 12 to 13 years now, and I have seen increases in the numbers of *Gallo* mussels at a number of sites throughout Puget Sound and in fact in British Columbia. But the interaction between gallos and trossulus appears to be very small, and in genetic studies that we have done using protein electrophoresis we see an interaction that would be on the scale of zero to 5% where we see mixed gene pools. I guess the bottom line is, yes, they do interact. It's my opinion that we don't know if *Gallo provincialis* is an introduced species or not. What we know is that we were able to differentiate the *Mytilus* siblings and we went and looked we found *Gallo provincialis* in Puget Sound and we find it in many places in the Puget Sound today. Whether it is a remnant of warmer ocean climates in eons past that is held on in Puget Sound or whether it was introduced in ballast water turn of the century or whether it was introduced by aquaculture is problematical. At this point I don't think we'll ever know the answer. The species that the industry depends on predominately are the Pacific oyster and the Manila clam, which are non-indigenous species, so you don't have a genetic interaction with native species more a habitat issue if there is an issue there and as we start to work with geoduck we are looking intensively at the genetic interaction. Very different than the salmon issue in that these animals broadcast spawn larvae for a larvae period of several weeks into the water circulation throughout the Puget Sound, so it is not migrating to a specific stream in a little different situation genetically but it is an area we are looking at.

Q: Can you talk a little bit about the procedures that went into developing that program (Chesapeake Bay) and the extent to which there is public input in terms in what the desired conditions are whether it is restoration or enhancement or specific services.

A: Actually we don't have this as well worked out as you suggest. Recently, particularly with the restoration issue is where we are seeing more of the public and the stakeholders come to the table. In fact, and I personally believe it's ultimately the biggest limitation in our shellfish aquaculture industry is its based about a 100 year old lease law. It is not private grounds, although they tend to refer to it as that was enacted in the old oyster fishery related to moving oyster seed around, placing it on the bottom. So in fact that we had in the last two decades is a rapid expansion continued to shellfish aquaculture but without any

real review of where it has taken place you don't even have to get a shellfish aquaculture permit you just have the old family shellfish lease, and in fact I contend that because we haven't had in recent times a dialogue about and brought the stakeholder to the table that that is going to be the big issue in shellfish aquaculture in Chesapeake Bay. Our old leasing program is based on a survey done in the 1880s. There is so much in other stakeholder involvement from the restoration end, here are going to be more user conflicts associated with shellfish culture. I don't know that we have any lessons for how to do that the right way.